

2020 Eighth International Symposium on Computing and Networking (CANDAR 2020)

**Naha, Japan
24-27 November 2020**



**IEEE Catalog Number: CFP2019X-POD
ISBN: 978-1-7281-8222-3**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP2019X-POD
ISBN (Print-On-Demand):	978-1-7281-8222-3
ISBN (Online):	978-1-7281-8221-6
ISSN:	2379-1888

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2020 Eighth International Symposium on Computing and Networking (CANDAR) **CANDAR 2020**

Table of Contents

Message from Organizers	ix
Conference Organization	x
Program Committee	xii
Reviewers	xvi

Long Papers

Face Completion with Pyramid Semantic Attention and Latent Codes	1
<i>Shilei Cao (Kyushu University) and Kouichi Sakurai (Kyushu University)</i>	
Derived Metrics for the Game of Go – Intrinsic Network Strength Assessment and Cheat-Detection	9
<i>Antti Törmänen (Nihon Ki-in – Japan Go Association)</i>	
A Learning-Based Fetch Thread Gating Mechanism for A Simultaneous Multithreading Processor	19
<i>Yosuke Ide (Keio University) and Nobuyuki Yamasaki (Keio University)</i>	
Efficient GPU Implementation for Solving the Maximum Independent Set Problem	29
<i>Tomohiro Imanaga (Hiroshima University), Koji Nakano (Hiroshima University), Masaki Tao (Hiroshima University), Ryota Yasudo (Hiroshima University), Yasuaki Ito (Hiroshima University), Yuya Kawamata (NTT DATA Corporation), Ryota Katsuki (NTT DATA Corporation), Yusuke Tabata (NTT DATA Corporation), Takashi Yazane (NTT DATA Corporation), and Kenichiro Hamano (NTT DATA Corporation)</i>	
Fully-Pipelined Architecture for Simulated Annealing-Based QUBO Solver on the FPGA	39
<i>Hiroshi Kagawa (Hiroshima University), Yasuaki Ito (Hiroshima University), Koji Nakano (Hiroshima University), Ryota Yasudo (Hiroshima University), Yuya Kawamata (NTT DATA Corporation), Ryota Katsuki (NTT DATA Corporation), Yusuke Tabata (NTT DATA Corporation), Takashi Yazane (NTT DATA Corporation), and Kenichiro Hamano (NTT DATA Corporation)</i>	
Emergency Landing Field Identification Based on a Hierarchical Ensemble Transfer Learning Model	49
<i>Andreas Klos (FernUniversität in Hagen), Marius Rosenbaum (FernUniversität in Hagen), and Wolfram Schiffmann (FernUniversität in Hagen)</i>	

Combinatorial Clustering Based on an Externally-Defined One-Hot Constraint .59.....	
	<i>Masahito Kumagai (Tohoku University), Kazuhiko Komatsu (Tohoku University), Fumiyo Takano (NEC Corporation), Takuya Araki (NEC Corporation), Masayuki Sato (Tohoku University), and Hiroaki Kobayashi (Tohoku University)</i>
Evacuation from a Finite 2D Square Grid Field by a Metamorphic Robotic System .69.....	
	<i>Junya Nakamura (Toyohashi University of Technology), Sayaka Kamei (Hiroshima University), and Yukiko Yamauchi (Kyushu University)</i>
Bandit-Based Run-Time Adaptation of Cache Replacement Policies in Content Management Systems .79.....	
	<i>Srivattsan Sridharan (University of Florida), Shravan Gaonkar (University of Florida), and Jose A. B. Fortes (University of Florida)</i>

Regular Papers

Graph Visualization of the Dark Web Hyperlink .89.....	
	<i>Taichi Aoki (Institute of Information Security) and Atsuhiko Goto (Institute of Information Security)</i>
Use Cases and Success Stories of a Data Analytics System in an Automotive Paint Shop .95.....	
	<i>Angel Dacal-Nieto (CTAG - Centro Tecnológico de Automoción de Galicia), Juan José Areal (PCAE – Peugeot Citroën Automóviles España S.A.), Miguel García-Fernández (CTAG - Centro Tecnológico de Automoción de Galicia), and Marcos Lluch (PCAE – Peugeot Citroën Automóviles España S.A.)</i>
Polymorphic Data Layout for SX-Aurora TSUBASA Vector Engines .101.....	
	<i>Naoki Ebata (Tohoku University), Yoko Isobe (NEC Corporation), Ryusuke Egawa (Tokyo Denki University), and Hiroyuki Takizawa (Tohoku University)</i>
An In-Network Parameter Aggregation using DPDK for Multi-GPU Deep Learning .108.....	
	<i>Masaki Furukawa (Keio University), Tomoya Itsubo (Keio University), and Hiroki Matsutani (Keio University)</i>
Public-Key Projective Arithmetic Functional Encryption .115.....	
	<i>Shingo Hasegawa (Tohoku University), Masashi Hisai (Panasonic Corporation), and Hiroki Shizuya (Tohoku University)</i>
Maximum Expressive Number of Threshold Neural Networks .122.....	
	<i>Kenta Inoue (Nihon Insight Technologies Corporation)</i>
Commutativity of Composition of Some Elementary Cellular Automata on Monoids .128.....	
	<i>Toshikazu Ishida (Kyushu Sangyo University) and Shuichi Inokuchi (Fukuoka Institute of Technology)</i>
On the Loop Suppression Method by Utilizing Information of Master Terminals for Neighboring Terminals in Bluetooth MANETs .134.....	
	<i>Haruki Ishizaki (Hiroshima City University), Ryohei Saka (Hiroshima City University), Eitaro Kohno (Hiroshima City University), and Yoshiaki Kakuda (Hiroshima City University)</i>
Low-bit Quantized CNN Acceleration Based on Bit-Serial Dot Product Unit with Zero-Bit Skip.141.	
	<i>Sora Isobe (University of Aizu) and Yoichi Tomioka (University of Aizu)</i>

ExtraFerns: Fully Parallel Ensemble Learning Technique with Non-Greedy yet Minimal Memory Access Training .146.....	
	<i>Shungo Kumazawa (Tokyo Institute of Technology), Kazushi Kawamura (Tokyo Institute of Technology), Thiem Van Chu (Tokyo Institute of Technology), Masato Motomura (Tokyo Institute of Technology), and Jaehoon Yu (Tokyo Institute of Technology)</i>
Extraction of Interpretable Decision Sets in Graph Databases .153.....	
	<i>Kota Matsuyama (Nihon University) and Tomonobu Ozaki (Nihon University)</i>
Analysis of a Method to Eliminate Fruitless Cycles for Pollard's rho Method with Skew Frobenius Mapping over a Barreto-Naehrig Curve .160.....	
	<i>Hiromasa Miura (Okayama University), Rikuya Matsumura (Okayama University), Takuya Kusaka (Okayama University), and Yasuyuki Nogami (Okayama University)</i>
Homomorphic Commitment Scheme with Constant Output Locality .167.....	
	<i>Hideaki Miyaji (Osaka University), Atsuko Miyaji (Osaka University), and Yuntao Wang (JAIST)</i>
Fast and Memory Efficient Approximated Convex Hull Computation with FPGA .174.....	
	<i>Tatsuma Mori (Nagasaki University), Taito Manabe (Nagasaki University), and Yuichiro Shibata (Nagasaki University)</i>
Performance Improvement of Hadoop ext4-Based Disk I/O .181.....	
	<i>Makoto Nakagami (Kogakuin University), Jose A.B. Fortes (University of Florida), and Saneyasu Yamaguchi (Kogakuin University)</i>
On the Connection-Establishment Request Control Method to Improve Data Packet Delivery Ratio at Densely Populated Areas for Bluetooth MANETs .188.....	
	<i>Akifumi Nomasaki (Hiroshima City University), Eitaro Kohno (Hiroshima City University), and Yoshiaki Kakuda (Hiroshima City University)</i>
Exploiting Temporal Parallelism in Particle-Based Incompressible Fluid Simulation on FPGA .195..	
	<i>Manfred Orsztynowicz (Keio University), Hideharu Amano (Keio University), Kenichi Kubota (Aeronautical Technology Directorate Japan Aerospace Exploration Agency), and Takaaki Miyajima (RIKEN Center for Computational Science)</i>
TCP BBR Performance Improvement on a Network with Increasing RTT .202.....	
	<i>Kanon Sasaki (Kogakuin University), Kouto Miyazawa (Kogakuin University), Kohei Ogawa (Kogakuin University), and Saneyasu Yamaguchi (Kogakuin University)</i>
Virtual Machine Monitor-Based Hiding Method for Access to Debug Registers .209.....	
	<i>Masaya Sato (Okayama University), Hideo Taniguchi (Okayama University), and Ryosuke Nakamura (Okayama University)</i>
ProgressiveNN: Achieving Computational Scalability without Network Alteration by MSB-First Accumulative Computation .215.....	
	<i>Junnosuke Suzuki (Tokyo Institute of Technology), Kota Ando (Tokyo Institute of Technology), Kazutoshi Hirose (Tokyo Institute of Technology), Kazushi Kawamura (Tokyo Institute of Technology), Thiem Van Chu (Tokyo Institute of Technology), Masato Motomura (Tokyo Institute of Technology), and Jaehoon Yu (Tokyo Institute of Technology)</i>

Bayes without Bayesian Learning for Resisting Adversarial Attacks .221.....	221
<i>Thi Thu Thao Khong (Nara Institute of Science and Technology), Takashi Nakada (Nara Institute of Science and Technology), and Yasuhiko Nakashima (Nara Institute of Science and Technology)</i>	
An Implementation Methodology for Neural Network on a Low-End FPGA Board .228.....	228
<i>Kaijie Wei (Keio University), Koki Honda (Keio University), and Hideharu Amano (Keio University)</i>	
Architecture-Aware Cost Function for 3D FPGA Placement Using Convolutional Neural Network 235	235
<i>Qian Zhao (Kyushu Institute of Technology), Motoki Amagasaki (Kumamoto University), Masahiro Iida (Kumamoto University), and Takaichi Yoshida (Kyushu Institute of Technology)</i>	
Author Index 243.	243